Übung zur Vorlesung

Informationsvisualisierung

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Time-Based Data

Visualization Basics [6]

Common Questions

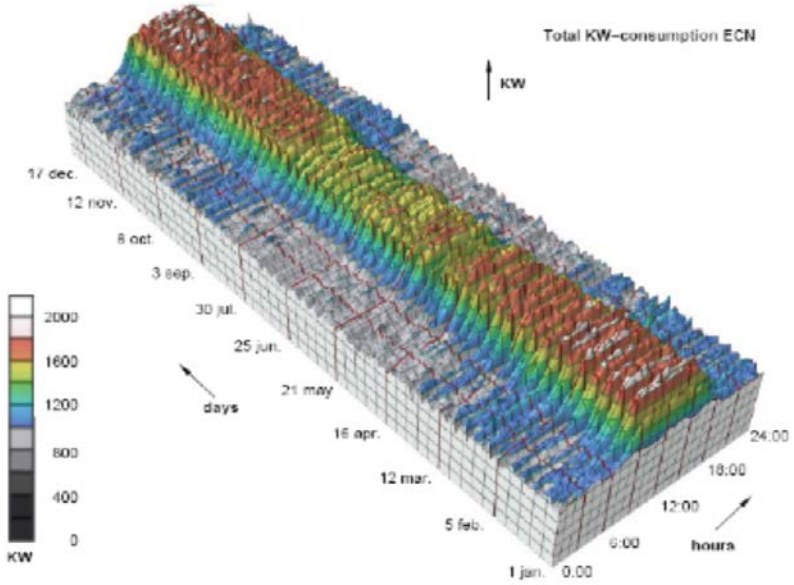
- Does a data element exist at a specific time?
- How long is the time span of the data element?
- How often does a data element occur?
- How fast is a data element changing?
- In what order do data elements appear?
- …

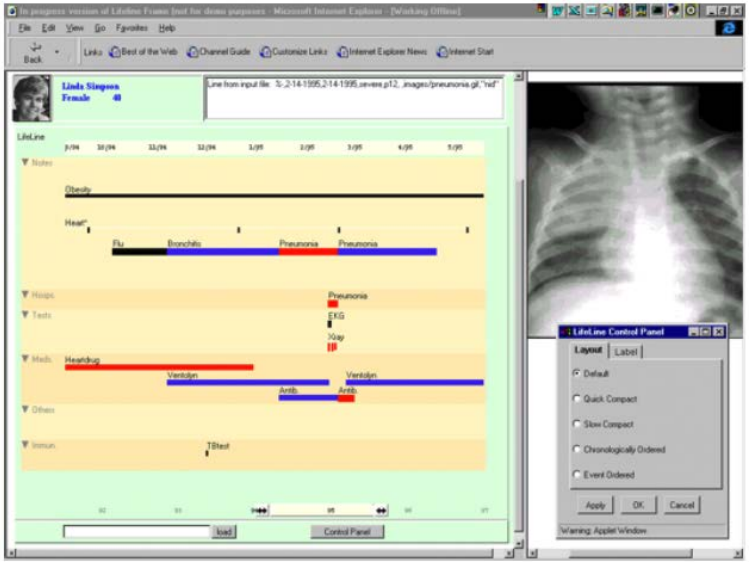
Time Axis Configuration

- Discrete time points vs. interval time
- Linear time vs. cyclic time
- Ordinal time vs. continuous time

Visualization Basics [6]

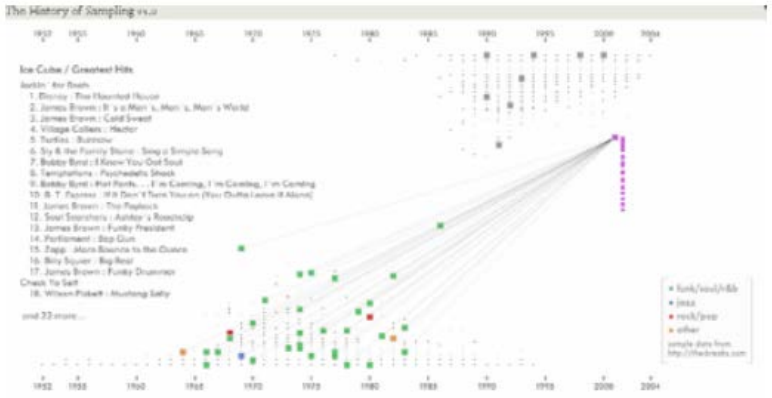
- Discrete time points vs. interval time

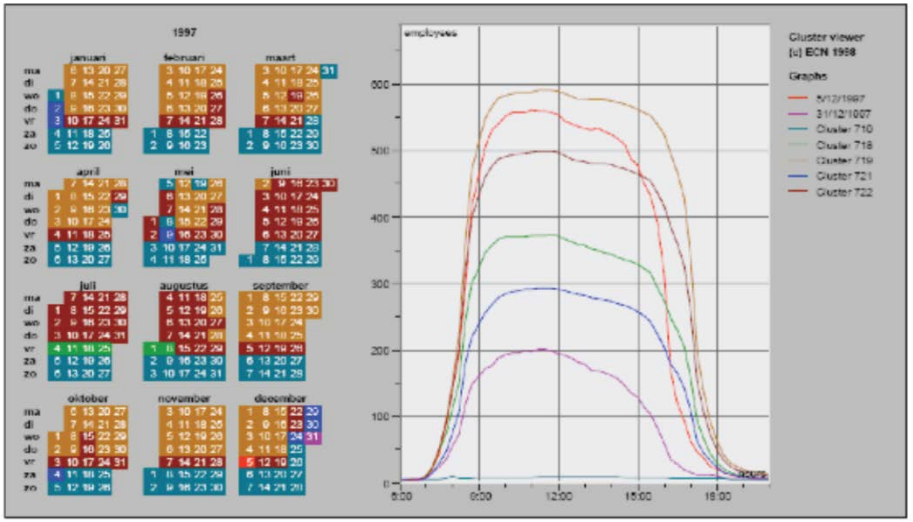




Visualization Basics [6]

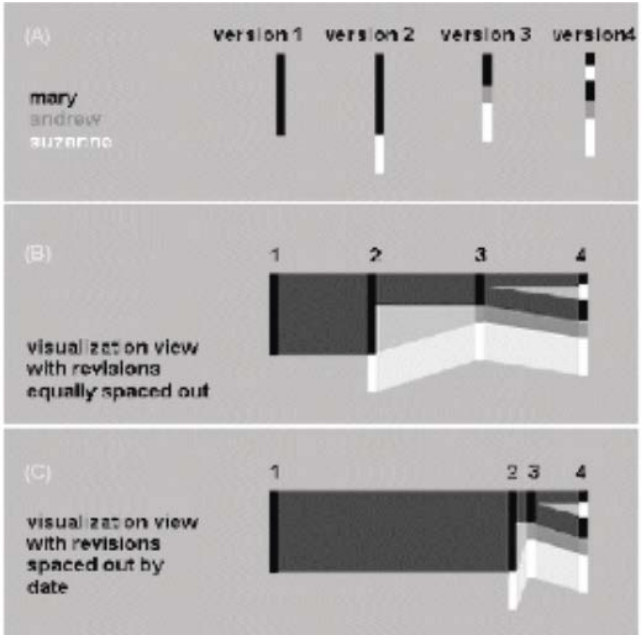
- Linear time vs. cyclic time

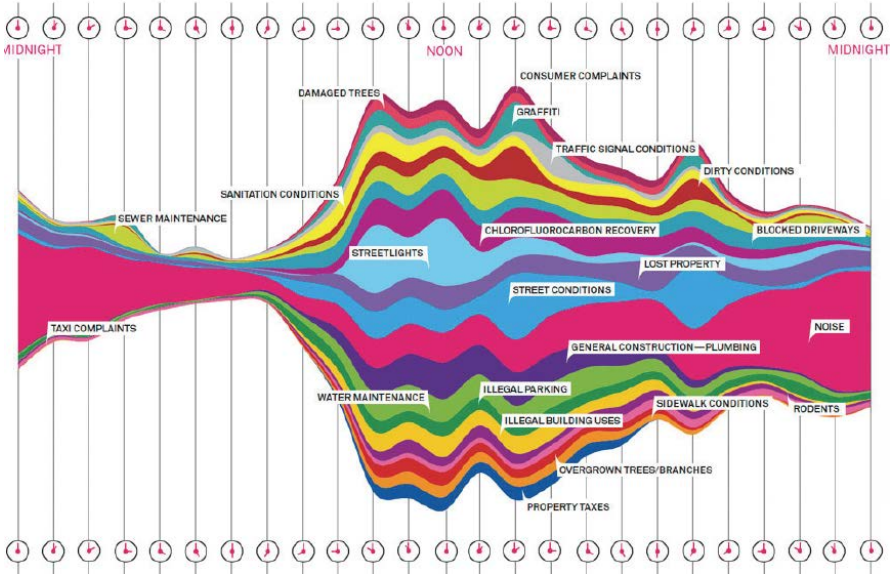




Visualization Basics [6]

- Ordinal time vs. continuous time:





Types of Visualization [6]

Static

- Discrete or continuous data
- Visualization does not change over time
- Explore patterns, time steps without temporal limitations

Dynamic

- Discrete or continuous data
- Visualization changes over time
- Conclusion of temporal behavior

Event-based:

- Discrete, continuous and event-based data
- Changes in data can not be foreseen

Example: LastHistory [1]

Text and Documents

Text and Documents: Basics

Characteristics

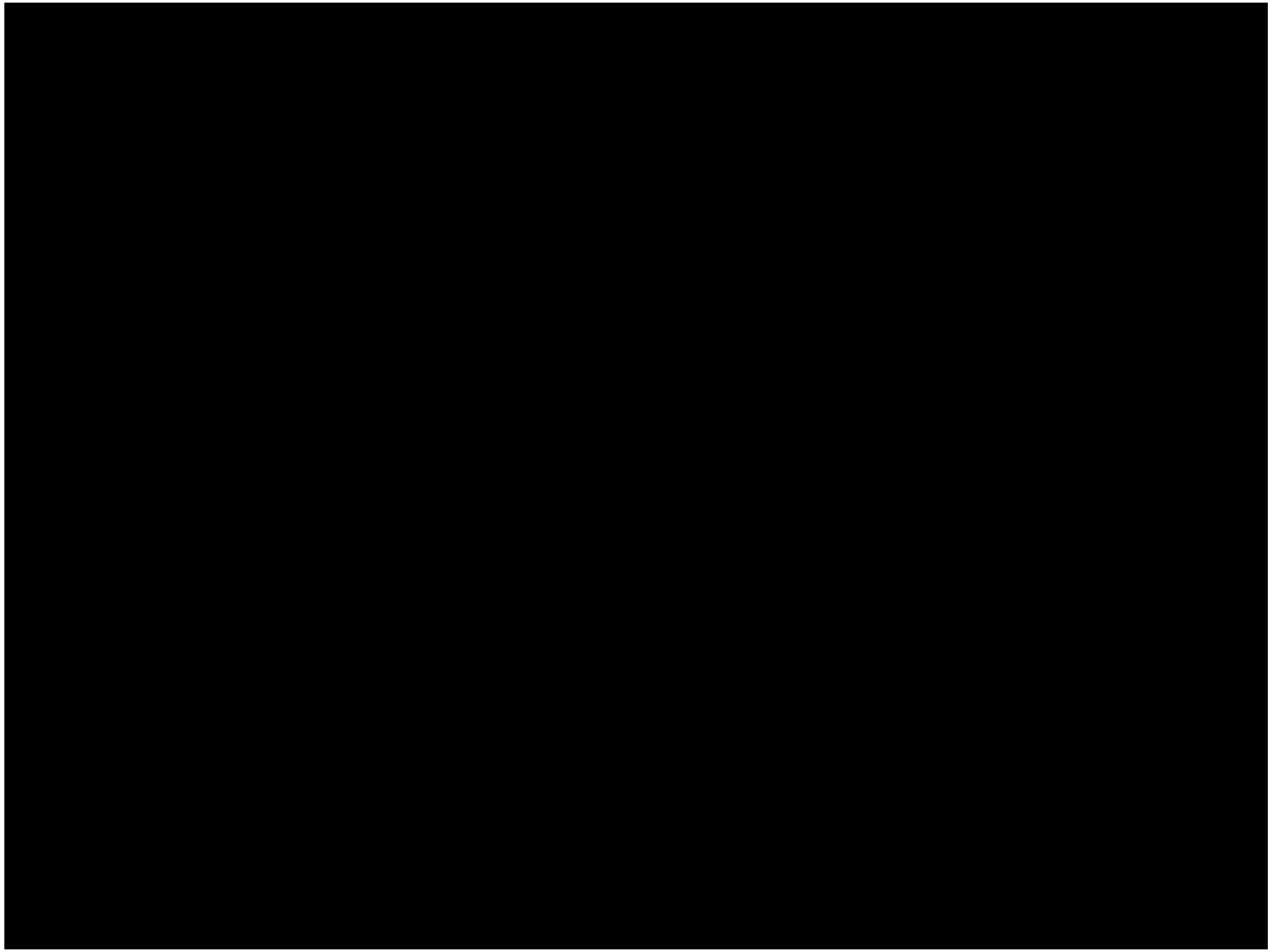
- Nominal data
- Interesting properties:
  - Meta data
  - Structure
  - Statistics
  - Semantics
  - …

Goals

- Detecting patterns
- Keyword search
- Cluster maps

Action Science Explorer

The Action Science Explorer [2]



http://www.youtube.com/watch?v=wdp-jZUqgcU

The Action Science Explorer [2]

Goals

- Find key authors and key papers
- Explore similar papers
- Explore historical development
- Summarize research fields

Interaction

- Linking and brushing
- Overview and detail
- Details on demand
- Dynamic queries

Arc Diagrams

Arc Diagrams [5]

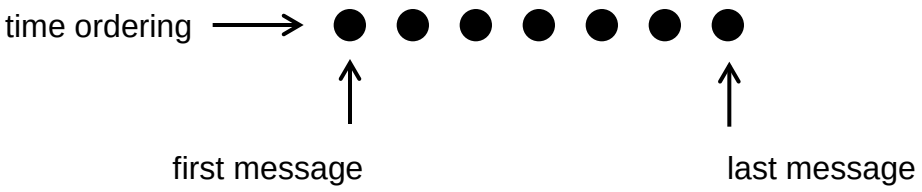
- Visualization complex patterns of repetitions

Thread Arcs [3]

- Visualization of e-mail threads
- Design goals:
  - Keep chronology
  - Show relationships
  - Compactness
  - Stability
  - Quick scanning
  - Quick interaction
  - Easy interpretable

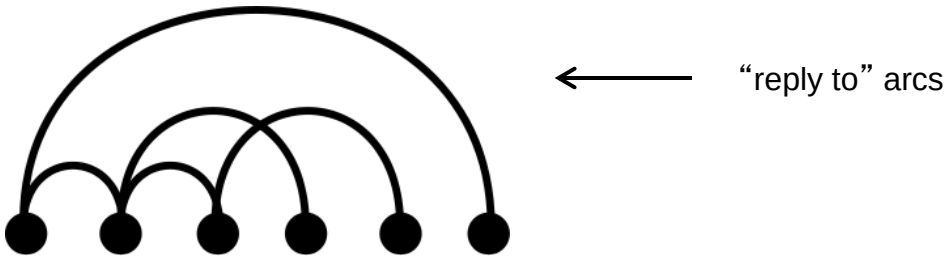
Thread Arcs

- Chronological ordering
  - width = linear function of thread size



[3]

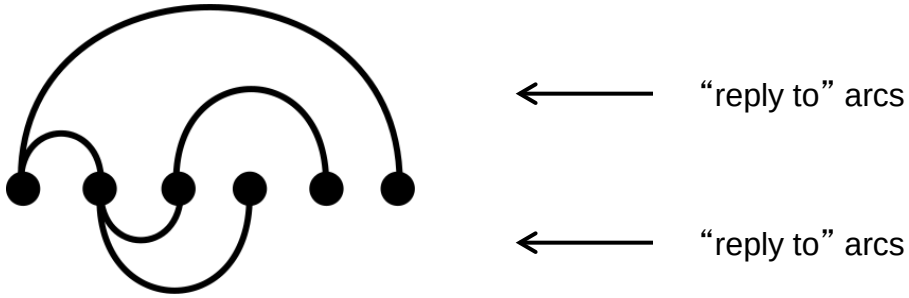
- Relationships



[3]

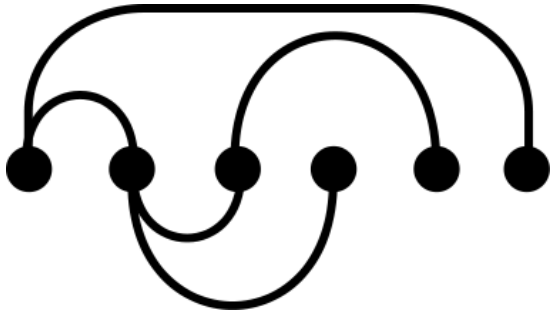
Thread Arcs

- Improvements
  - “The relationships between messages are clearer when arcs are drawn above and below nodes.” [3]

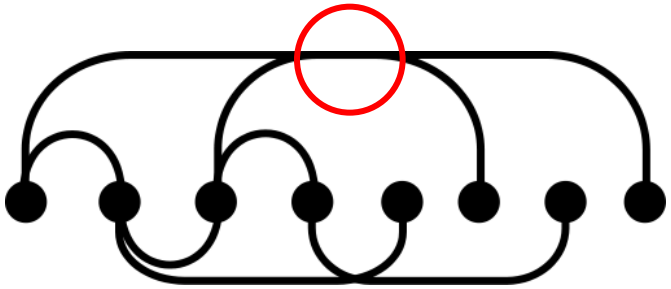


Thread Arcs

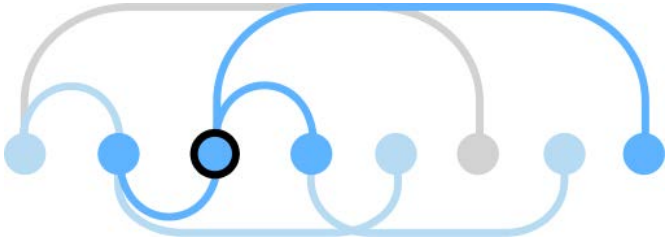
- Improvements
  - “Constraining the maximum height of the arcs makes the visualization more compact.” [3]



  - Problem: Overlap

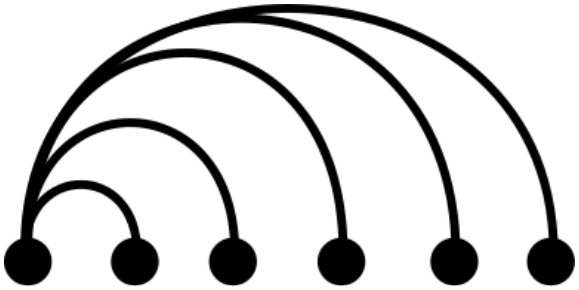


Solution: selection highlighting



Thread Arcs

- Conversation types:
  - Advantages: makes different conversations easily comparable



bushy

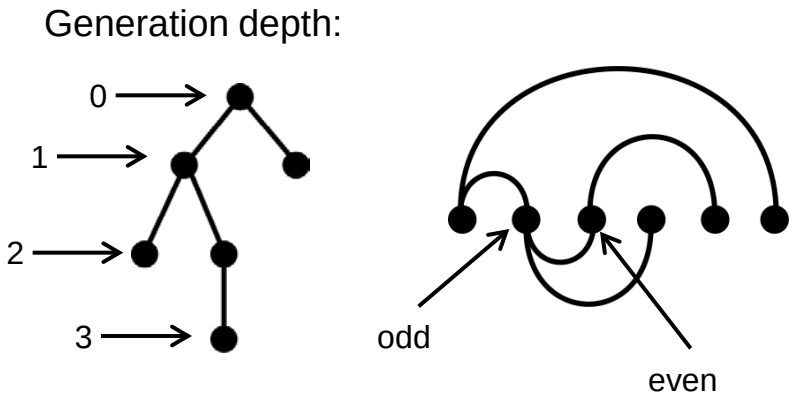
Several answers per message
=> Could be a group conversation

narrow

[3]

One answer per message
=> Could be a private conversation

Thread Arcs

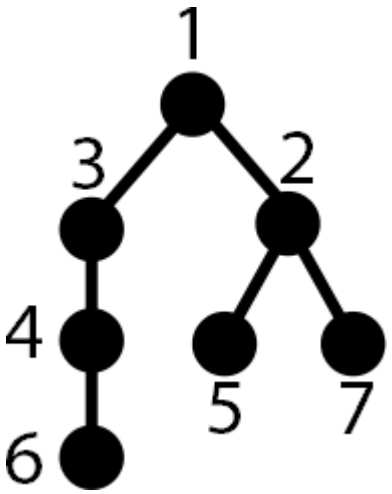


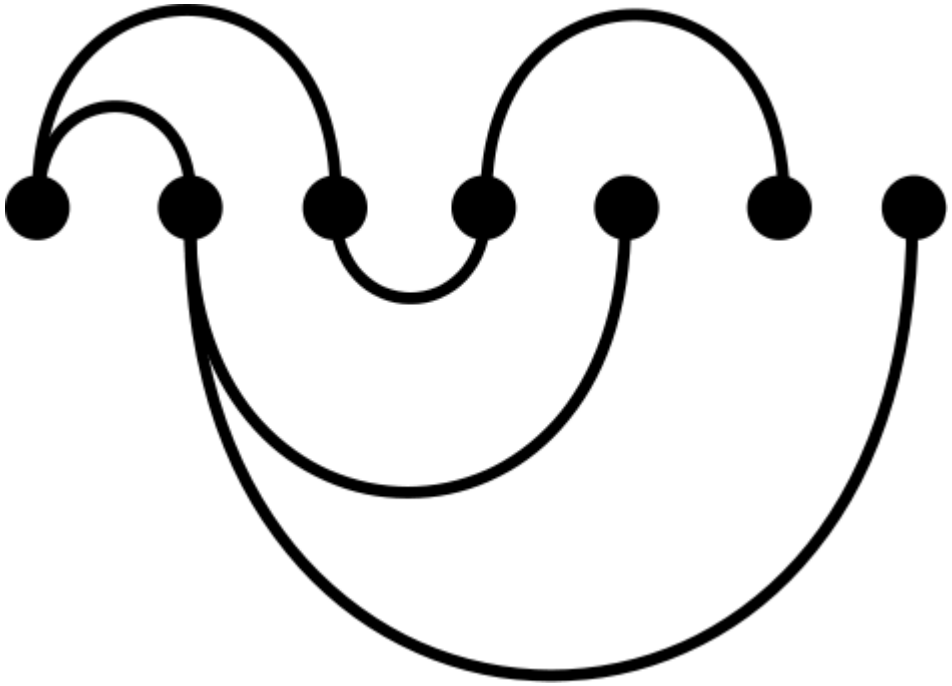
- Pseudo-code [3]:

```
sort all messages chronologically
find the generation depth of each message
for each message
    if the message is the root then
        place the node at the starting position and don't draw an arc
    else
        place the message to the right of the last message
        if the message generation depth is odd then
            draw an arc above the line to the message's parent
        else
            draw an arc below the line to the message's parent
next message
```

Create a thread arc for the following message structure (represented as a tree diagram).

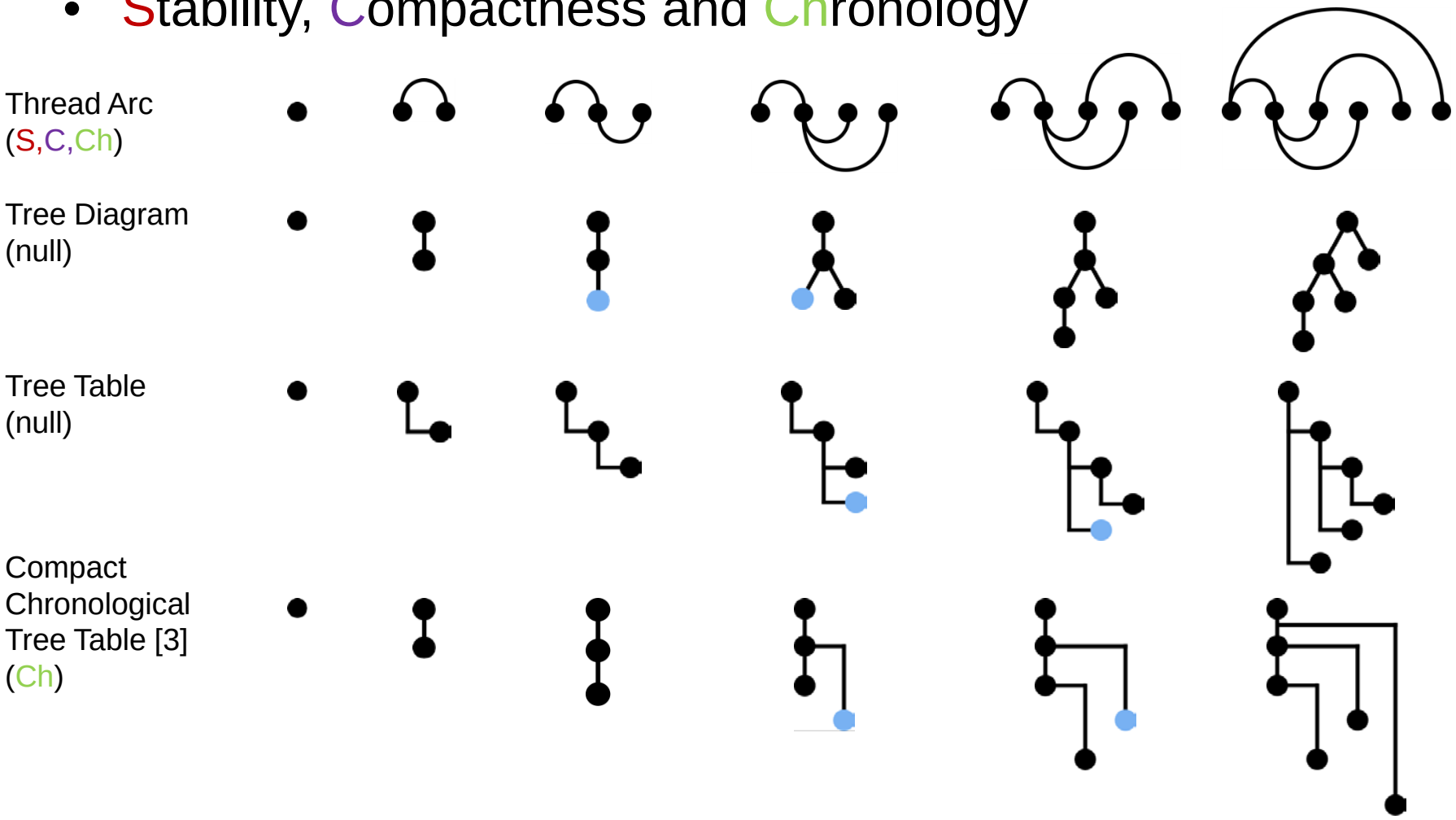
The number represent the chronological order.





Thread Arcs

- Stability, Compactness and Chronology

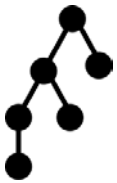


[3]

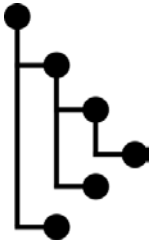
Thread Arcs

- Chronology

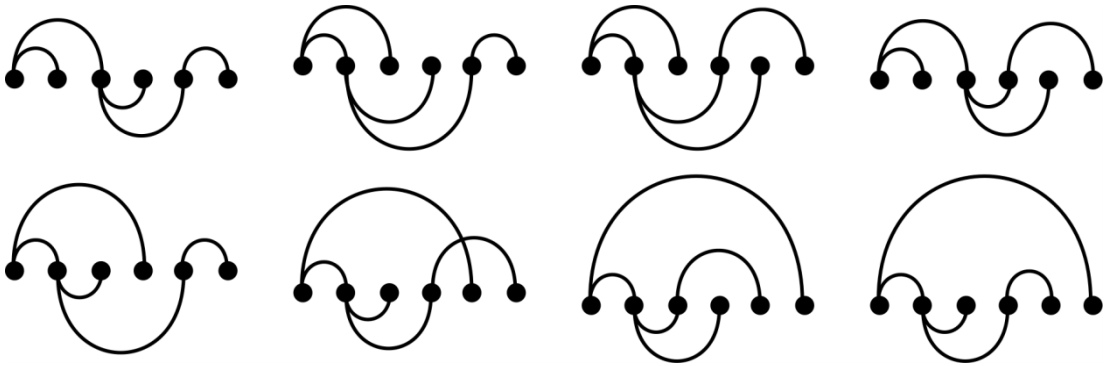
Tree Diagram



Tree Table



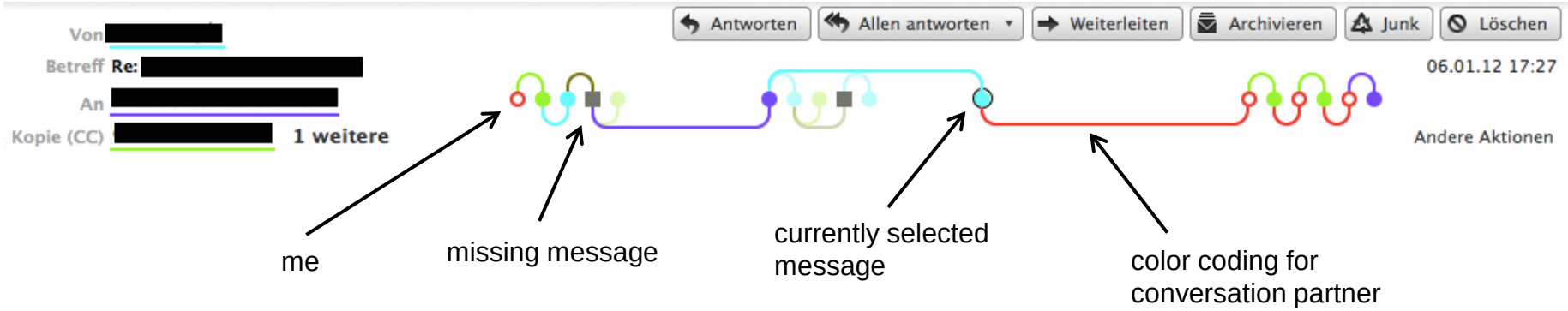
Thread Arc

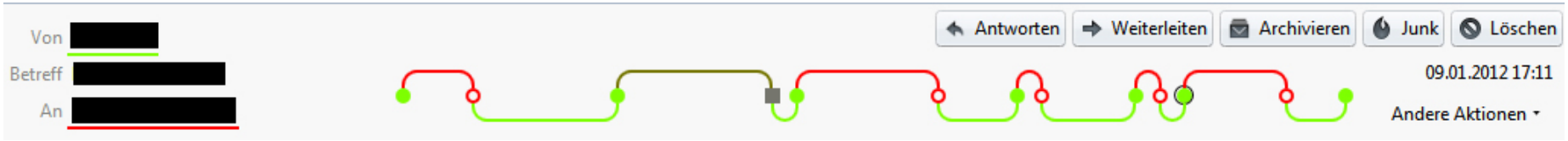


[3]

Thread Arcs

- Example: ThreadVis (Thunderbird)





Roadmap

- Finale Abgabe: 22.01.2015
- Präsentationen in den Übungen am 22./ 23. Januar

- Wiederholung in den Übungen am 29./30. Januar
  -> Fragen zu Vorlesung und Übung vorab per Mail

References

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